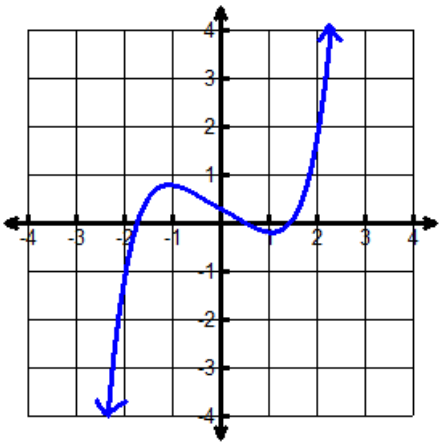
4.6-4.9 Review

Name _____ **Date** _____ **Period** _____

Find the average rate of change for each function on the specified interval. Show work!

1. $f(x)=x^2-5x+2$ on $[-2,4]$

2. $f(x)=\sqrt[3]{x+2}$ on $[-3,6]$

3. 

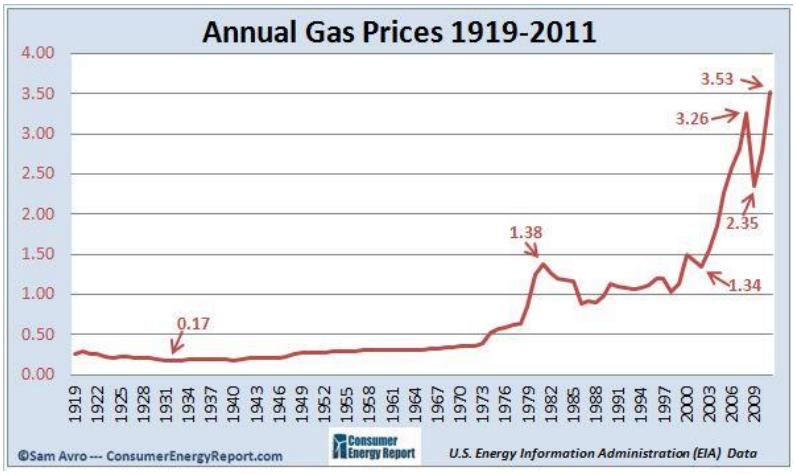
on $\left[-2,\frac{1}{2}\right]$

4.

x	y
-10	1024
-7	128
-5	32
-1	2
0	1
1	$\frac{1}{2}$
3	$\frac{1}{8}$

on $[-5,\ 1]$

5. The graph below shows the annual gas prices from 1919-2011. Find the average rate of change from 2002 to 2009? Interpret the meaning of your answer. Show work!



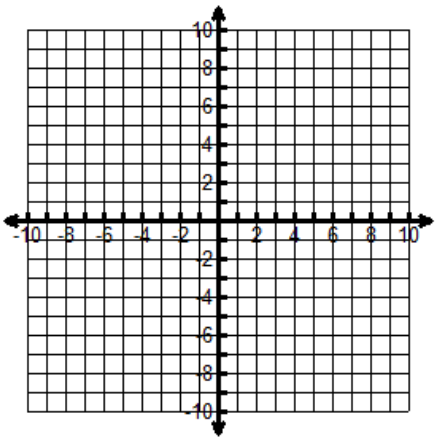
6. A square of side *x* meters is cut out of each corner of a 3 meter by 5 meter piece of cardboard to form a box. Determine the domain of the volume function in terms of *x*. **Show work! Explain your answer.**

7. A football thrown in the air with initial velocity 50 ft/sec is modeled by $h(t) = -16t^2 + 50t + 4$. If the ball falls incomplete what is the real world domain for this model? **Show work! Explain your answer.**

8. A hedge *x* feet wide is planted inside the borders of a garden with dimensions 16 feet by 24 feet. Determine the domain of the area function that describes the reduced garden in terms of *x*. **Show work! Explain your answer.**

Solve the system of equations by graphing. Sketch each function *f(x)* and *g(x)* on one graph and label the intersecting points (solutions). Round coordinates to the nearest tenth.

9. $f(x) = x^3 + x^2 - 6x$
   $g(x) = -3x + 1$



Solve each equation by using substitution. Show work!

10. $(x-2)^2+(x-2)-6=0$

11. $\frac{3}{(x+3)^2}+\frac{5}{(x+3)}=2$

Use sign charts to solve each inequality. Show work!

12. $x^2+x-6\le 0$

13. $\frac{x-1}{x^2-36}>0$

Solve each equation for the specified variable. Show all work!

14. $\frac{T^2}{l}=\frac{4\pi^2}{g}$, *solve for g*

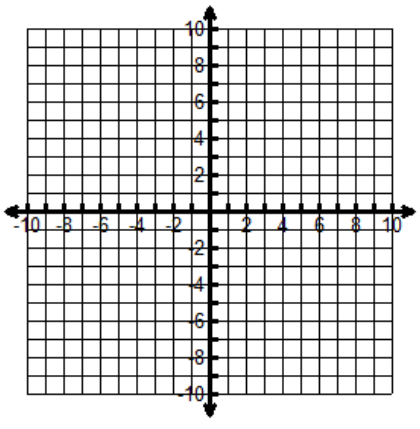
15. $\sqrt{b^2-4ac}=\mathrm{k}$, *solve for c*

For the sequence write and graph the rational equation that models the relationship between the term and the sequence and its value. Fill in the table for the term and value.

16. $2, \frac{3}{4}, \frac{4}{9}, \frac{5}{16}, \ldots$

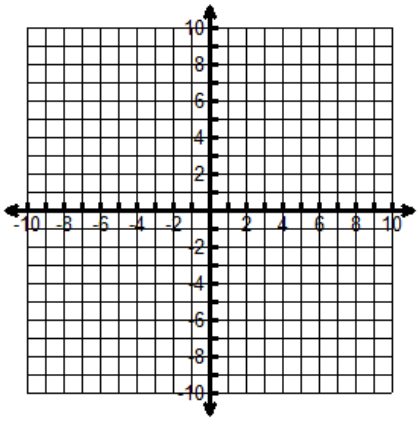
Function: _____

Term	Value



Solve the system of inequalities graphically.

17. $-2x-3y<12$
$3x+5y\le 15$



Find an algebraic expression for *h(x)* and determine its domain. Show all work!

18. $f(x)=2x-3$ *and* $g(x)=\sqrt{x-1}$

a. $h(x)=(f+g)(x)=$

b. $h(x)=(f-g)(x)=$

c. $h(x)=(fg)(x)=$

d. $h(x)=(\frac{f}{g})(x)=$

e. $h(x)=(f\circ g)(x)=$

f. $h(x)=(g\circ f)(x)=$

Use the given functions to evaluate each of the following: Show work!

$f(x) = x - 5$ $\quad$ $g(x) = \sqrt{x+1}$ $\quad$ $h(x) = \dfrac{2}{x-1}$

19. $f(-2) \cdot g(3)$

20. $g(15) \cdot h(3)$

21. $f(5) + h(9)$

22. $\dfrac{g(24)}{f(15)}$

23. $h(3) - f(-8)$

24. $\dfrac{h(2)}{g(35)}$

25. $(f \circ g)(3)$

26. $(g \circ f)(20)$

27. $(h \circ g)(24)$

28. An open box is made from a rectangular piece of cardboard measuring 20 inches by 12 inches, by cutting identical squares from the corners and turning up the sides. The length of the finished box cannot be less than 12 inches.

a) Draw and label a model of this problem.

b) Write a function for the volume of the box.

c) Give the domain of the function in the context of the problem.

d) Give one dimension that the corner squares could have and find the volume for the box.

e) Use technology to find the maximum volume the box can have. Give the dimensions (length, width, and height) of the box and the maximum volume, both to the nearest tenth of an inch.